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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/649,729	08/28/2003	Koichi Shimizu	826.1891	5709

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EXAMINER	
LAY, MICHELLE K	
ART UNIT	PAPER NUMBER
2628	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/05/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/649,729	SHIMIZU, KOICHI	
	Examiner	Art Unit	
	Michelle K. Lay	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 November 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments, filed 11/27/2006, with respect to the rejection(s) of claim(s) 1-27 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Borrel et al. (5,448,686).

Furthermore, based on Applicant's arguments, the specification objection and *35 USC §112*, first paragraph made in the Non-Final office action filed 07/25/2006 has been withdrawn.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims **1-5**, **9-13**, **17-21**, and **25-27** are rejected under 35 U.S.C. 103(a) as being unpatentable over Isaacs (5,894,308) in view of Borrel et al. (5,448,686).

Issacs teaches the limitations of claims 1-5, 9-13, 17-21, and 25-27 with the exception of maintaining the adjacent planes in the model but not displayed. However, Borrel discloses a system/method for simplifying a model using recursive levels and simplification factors comprising an octree, where the octree maintains all of the vertices of the model regardless of being displayed.

In regards to claims **1**, **9**, and **17**, Isaacs teaches of a method, system, and program for altering the number of polygons used to create a 3D graphic object such that a simplified model of the original complex 3D object is created. A computer setup for running software allows a user to view and create 3D objects [col. 5 lines 8-17]. The Polygon Reduction Editor is a tool that allows a user (or 3D content developer) to reduce the polygon count within models of 3D graphic objects in an interactive and real time manner [col. 5 lines 20-24]. Furthermore, the program of Isaacs is being embodied as a graphical user interface [col. 5 lines 31-34]. Thus, Isaacs teaches that his invention includes a method, apparatus, and program for altering the number of polygons used to create a 3D graphic object. The latter four techniques (3-6) each may be used separately or together in various combinations of two or more. In addition, these four techniques may be used in conjunction with either or both of two additional features: (a) locking user-selected points in the 3D graphic object and (b) conserving surface boundary edges in the 3D graphic object [col. 7 lines 21-26]. Thus, points from the detailed shape are selected. Triangular planes are generated to represent the 3D object that are configured in part by apex points of the 3D object in each of the three dimensions [col. 7 lines 38-54]. Thus, select points on the 3D object are used to generate a plane in the bounding box or octahedron techniques as described by Isaacs. Figs. 5 and 6 show a model-generating window in which a simplified model corresponding to a detailed 3D object is created composed of the apex points that indicated the generated triangular planes.

Borrel teaches a system/method for processing a model of an object so as to produce a simplified model. With reference to Fig. 1, the raster graphics system (10) includes a main processor (12) and a graphics subsystem (15). The host processor (12) executes an application program and dispatches graphics tasks to the graphics subsystem (14) [col. 3 lines 56-68]. The system (10) includes user input devices such as a keyboard (16a) and/or a pointing device, such as a mouse (16b) [col. 10 lines 11-17]. A Geometric Processing unit (18) performs geometric and perspective transformations. The resulting graphics primitives, e.g., vertices, lines, triangles, etc., are described in screen space [col. 4 lines 1-5]. A display unit (24) receives pixels from the Graphics Buffer unit (22) and transforms these pixels into information displayed on the output device (16) [col. 4 lines 13-16]. Normals may be attached to faces or to vertices [col. 4 lines 43-44]. Each object is described by their bounding polygons where each of the polygons is represented as an ordered list of vertices [col. 4 lines 21-29]. The simplification technique can be performed recursively. When many simplification levels are desired, the simplification factors form a geometric sequence (e.g., one is the double of the previous one), resulting in an octree structure illustrated in Fig. 3 [col. 5 lines 10-15]. The octree provides the vertices of the lowest simplification level. All higher simplification levels are obtained by computing representative vertices for each intermediate node of the octree [col. 5 lines 27-30]. Thus, regardless of the level of simplification, all of the vertices of the model are within the octree (said ***maintained in model***).

Therefore, it would have been obvious to one of ordinary skill in the art to apply the simplification factors of Borrel within the simplification process of Issacs because it is important to maintain edges in the adjacent vertices of the original Model. If the resulting edges were not preserved the simplification technique would result in the elimination of the simplified model [Borrel: col. 8 lines 2-10].

In regards to claims **2**, **10**, and **18**, Isaacs describes the use of a mouse pointer in the system. Typically, a cursor control device such as a mouse is used to manipulate widgets 407-449 although any other input device could be used for this purpose [col. 5 lines 51-54]. Furthermore, Isaacs teaches of locking user-selected points in the 3D object [col. 7 lines 21-27]. The mouse is used to select the user-selected points for locking purposes. When it is desired to use the Lock/Unlock Points feature to reduce the number of triangles in the 3D image, the user clicks on the Lock/Unlock Points button 411 thereby causing a mark 701 to appear in the box indicating that the feature is active, as shown in FIG. 15a. Using the cursor or other input device, the user then selects one or more strategic points in the 3D object that, when preserved, maintain the integrity of the image [col. 10 lines 30-37].

In regards to claims **3-5**, **11-13**, and **19-21**, Issacs teaches that although 3D objects in the Polygon Reduction Editor are modeled using only triangles, the techniques described here may be applied to any other class or combination of classes of polygons (e.g., rectangles) to achieve similar results [col. 7 lines 9-12]. Thus, Isaacs teaches that

the simplified model may be configured by a plurality of polygons such as triangles or quadrangles.

In regards to claims **25-27**, Issacs describe generating triangular planes to represent the 3D object that are configured in part by apex points of the 3D object in each of the three dimensions [col. 7 lines 38-54]. Additionally, Issacs teaches of conserving surface boundary edges of the original 3D graphic object [col. 7 lines 21-27]. Furthermore, teaches of a process in which edges of the original object are preserved or discarded based on length [col. 8]. Thus, the simplified model is created using data composed of data of selected points, lines connecting the points, and therefore data of a plane described by the points and lines.

2. Claims **6**, **7**, **14**, **15**, **22**, and **23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Isaacs (5,894,308) in view of Borrel et al. (5,448,686) as applied to claims 1, 9, and 17 above, and in further view of Brittain et al. (6,072,498).

Isaacs in view of Borrel teaches of the invention of claims **6**, **14**, and **22** except wherein a simplified model configured by selected points is displayed in a display region different from the detailed shape. Column 10, lines 25-43, teaches of selecting points on a display screen on which a detailed 3D object is displayed. Column 12, lines 64-67, and column 13, lines 1-14, discloses a viewing button such that when selected, the user is able to alter the viewpoint of the 3D object through mouse movements and button clicking techniques. The invention of Brittain teaches of a user selectable degradation

technique for creating a simplified model of a complex object. Figures 4a-4d teach of displaying different views of a graphical object in separate windows. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Isaacs in view of Borrel to include displaying different viewpoints of the 3D object in separate windows as in Brittain. One would have been motivated to make such a modification to the invention of Isaacs so that a user may be able to simultaneously view the alternate viewpoints of the 3D object as offered by Isaacs in view of Borrel. Additionally, element 330 shows a selected object in which a simplified model will be created. Figure 4c shows the graphical element with a simplified bounding box surrounding it in the active frame while the other inactive frames show only the simplified bounding box representing the complex object. Column 8, lines 13-26, describes rendering objects in a simplified manner in response a reduction in frame rate due to object manipulation or increased computational load due to background tasks. Thus, the invention of Brittain includes displaying a simplified model in a display region different from the detailed object. Column 5, lines 19-23 of Isaacs, describes the polygon reducing invention as being interactive in real time. Column 6, lines 53-67, and column 7, lines 1-8, describe the real time interactive nature of the invention being diminished if the 3D object under consideration is sufficiently complex. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the invention of Isaacs to include displaying the simplified model configured by selected points in a display region different from the detailed 3D object as in Brittain. One would have been motivated to make such a modification to

Isaacs in view of Borrel such that during computational intensive tasks in the invention of Isaacs the alternative viewpoint images may be temporarily replaced by simplified models, thus reducing the processing required for displaying the alternative views and allowing more processing to be performed on the reduction calculations.

Isaacs in view of Borrel teaches of the invention of claims **7**, **15**, and **23** except wherein the simplified model is overlaid on the detailed shape and displayed. Figure 4c, of Brittain, shows a simplified bounding box model of a complex object in which the simplified model is overlaid on the complex shape and displayed in such a manner that the complex object is still viewable while being overlaid by the bounding box. Thus, the invention of Brittain teaches of drawing a simplified bounding box translucently overtop the complex object. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Isaacs so that the simplified model was drawn translucently and laid overtop the complex 3D object as in Brittain. One would have been motivated to make such a modification to the invention of Isaacs in view of Borrel so that a user could more easily determine a suitable level of simplification with respect to the original 3D object by comparing the simplified and complex shapes simultaneously in the same frame.

3. Claims **8**, **16**, and **24** are rejected under 35 U.S.C. 103(a) as being unpatentable over to Isaacs (5,894,308) and Borrel et al. (5,448,686) in view of Brittain et al.

(6,072,498) as applied to claims 7, 15, and 23, respectively, and further in view of Schuur et al. (5,504,853).

Isaacs, Borrel and Brittain, as applied to claims 7, 15, and 23 teach of the invention of claims **8**, **16**, and **24**, respectively, except wherein the simplified model and the detailed shape are displayed in different colors. The invention of Schuur et al. teaches of overlaying a mark on a figure by a user with a specific pattern and color as described in column 7, lines 36-55. It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the invention of Isaacs to include allowing the overlaid simplified model to be drawn with a specific color so as to stand out form its corresponding complex shape as in Schuur et al. One would have been motivated to make such a modification to the invention of Isaacs so that while comparing the two overlaid images, a viewer would be better able to discern between the two models.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle K. Lay whose telephone number is (571) 272-7661. The examiner can normally be reached on Monday-Friday 7:30a-5p.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kee M. Tung can be reached on (571) 272-7794. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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